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Temporary Mechanical Substitute for the Left Ventricle in Man

By temporary substitution for the left ventricle is meant its complete bypass temporarily by all of the blood that normally passes through it. This is accomplished by withdrawing the blood from the left atrium, passing it through the artificial left heart, and returning it to the aorta by way of the left subclavian artery. The systemic circulation is thereby artificially maintained while the right heart and the lungs continue to perform their functions.

Complete bypass of the left ventricle by the blood would be helpful in several conditions. Foreign bodies can be removed from the wall of the heart without danger of hemorrhage. It is theoretically possible that such pathologic processes as aneurysms of the left ventricle, severely infarcted areas, and neoplasms involving the heart wall could be resected while the systemic circulation is maintained. Because both the mitral valve and the aortic valve are not functioning while the left ventricle is being bypassed, pathologic conditions involving these valves would be more amenable to surgical procedures.

The experimental background for the substitution of an artificial pumping mechanism for the left ventricle is discussed. The successful temporary, total substitution of such a mechanism for the left ventricle in man is reported; complete substitution was maintained for 50 minutes. The maximal blood flow artificially maintained was 4-1/2 liters per minute.

The benefits to the patient have not been fully evaluated. The clinical examination, however, indicates that there is definite improvement. To the authors' knowledge, this is the first instance of survival of a patient when a mechanical heart mechanism was used to take over the complete function of maintaining the blood supply of the body while the heart was opened and operated on. (J. A. M. A., Oct. 18, 1952, F. D. Dodrill, E. Hill, and R. A. Gerisch)

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A New Antifertility Factor

Since 1949 the author has been working on an orally administered factor that promises safe and controllable antifertility activity. This work was undertaken after Beiler and Martin's discovery of a new antihemorrhagic factor which in vitro and in vivo in animals, had direct inhibitory action on the enzyme hyaluronidase. They found that the sulfonated and phosphorylated hespiridins inhibited materially the enzyme action of hyaluronidase. Recent reports have specifically established a relationship of hyaluronidase to the coronal cells of the ova by a dispersion action. This action is identical with the so-called spreading factor of Duran-Reynals, which was corroborated later by McClean.

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Hyaluronic acid is a mucopolysaccharide acid found in almost all animal tissues. Myer's classic experiments showed that the gels formed by hyaluronic acid are a part of the viscous barriers that regulate the exchange of various metabolites and water. Earlier experiments proved that at strategic points in the organism hyaluronic acid gels are disaggregated and depolymerized by the action of the enzyme hyaluronidase. This action reduces the viscosity of the "tissue cement." Myer further demonstrated that the enzyme hyaluronidase acts specifically by hydrolyzing hyaluronic acid.

It was this work that formed the basis for the hypothesis that when the hyaluronidase is in proper concentration in the cells of the spermatozoa and ovum and in the surrounding interstitial fluids, a hesperidin derivative at the proper saturation may act as an inhibitor, and this inhibitory action on the hyaluronidase occurs at the moment when the sperm comes in contact with the coronal cell layer of the ovum. It is now known that in the presence of the hesperidin derivative the entire coronal cell layer remains intact, and, in addition, more "tissue cement" is formed, both of which surround the ovum to form an impregnable barrier to the piercing spermatozoa.

In the present study of 300 married couples the antifertility action of the drug was complete except for 2 cases described. The 2 so-called failures are of no scientific significance, because of the lack of cooperation of the couples, as revealed by the method of dispensing medication. The tablets were bottled in lots of 100, each bottle recorded on a tally card for the patient to whom it was given, with the date and dosage for that patient. No one but members of the office staff dispensed the tablets. When a patient applied for more tablets he was required to return any remaining from the previous lot. Before more tablets were dispensed, a tally was made against the previous date and daily dosage. The number of tablets returned plus the number calculated should be equal to the total number dispensed for that period.

The necessity of divided dosage over a 24-hour period is discussed. This was important to establish a blood saturation level, which remained fairly constant over a 24-hour period. Experience has proved that the drug is best administered with meals; when necessary, a fourth dose can be given at bedtime. The author's general rule was to prescribe 4 doses for the wife, and 3 doses for the husband during the 24-hour period. A constant observation in all couples taking this medication was the lack of rebellion against taking the medication in divided doses. Patients who have been opposed to taking pills all their lives seemed willing to take this factor. It is most important to impress upon the couples this distribution of dosage, as success depends upon the blood saturation.

This drug is an oral medication, physiological in action, which can be taken indefinitely without toxic effects or permanent inhibition of fertility. The medication must be taken for 10 consecutive days by both partners

before antifertility action can be assured, and thereafter continuously by both partners at the prescribed daily divided dose. Fertility can be restored merely by omitting the drug for a 48-hour period. Should medication be omitted for 48 hours by either member of the couple, the 10 consecutive days of therapy must be repeated by both partners in order to re-establish fertility control. Following pregnancy, these 10 consecutive days of medication should not be started until after the first menstrual period postpartum. Phosphorylated hesperidin has been given clinically along with other substitution factors, such as vitamins, endocrines, amphetamine derivatives, and decholic acid derivatives without apparent interference in its action. As has been shown in both the text and tables, its antifertility action is not inhibited by trauma, infectious diseases, or systemic diseases. Again a word of warning must be expressed——it must be remembered that only one specific radical of this drug, phosphorylated hesperidin has antifertility activity.

It must be realized that this preliminary report is presented for its experimental value only. Much more clinical data must be accumulated before the general use of this antifertility factor is warranted. (Science, Oct. 10, 1952, B. F. Sieve)

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Isoniazid in Miliary and Meningeal Tuberculosis

The present report is concerned with the investigation of the use of isoniazid (isonicotinic acid hydrazide) in children and adults with acute generalized hematogenous tuberculosis (miliary) and tuberculous meningitis. The investigation was conducted as a joint enterprise at the New York Hospital-Cornell Medical Center and on the Navajo and Hopi reservation in Arizona.

The patients treated were children or adults with acute generalized hematogenous (miliary) tuberculosis, tuberculous meningitis, or a combination of both forms of tuberculous disease.

The diagnosis of miliary tuberculosis was based on the presence of the triad: an acute febrile illness, the characteristic disseminated densities in roentgenograms of the chest, and the demonstration of acid-fast bacilli on microscopic examination of body discharges or of Mycobacterium tuberculosis by culture.

The diagnosis of meningeal tuberculosis was established by culturing Myco. tuberculosis from the cerebrospinal fluid or by the demonstration in the cerebrospinal fluid of nonpurulent meningitis with a low concentration of sugar (less than 35 mg. per 100 ml.) in a patient with a bacteriologically proved lesion of tuberculosis elsewhere.

The type and timing of the clinical, bacteriologic, and roentgenographic observations made of the course of the miliary and meningeal infections

during isoniazid administration are similar to those listed in previous reports from this laboratory.

During the acute illness, all of the patients were maintained on bed rest with the exception of bathroom privileges in a few instances. In some of the meningitis cases after clinical remission had been obtained, a certain degree of ambulatory activity within the hospital wards was permitted.

Isoniazid was supplied in scored tablets or as a highly purified crystalline powder incorporated in capsules containing 10 to 25 milligrams.

With relatively few exceptions, all patients received approximately 10 mg. of isoniazid per kg. of body weight daily throughout the first week's administration. Regardless of the course at that time, the dose was usually lowered to between 7 and 5 mg. per kg. daily thereafter. In no instances has therapy been discontinued, and at present it is planned to continue the chemotherapy of each patient for a total period of 12 months.

An investigation was made of the influence of isoniazid on the course of acute miliary tuberculosis in 14 patients, 4 of whom also had meningitis. An additional 11 patients with tuberculous meningitis (2 of whom also had miliary tuberculosis) received isoniazid together with, or subsequent to, streptomycin therapy.

Two deaths, both from meningitis, occurred in the 14 patients with acute miliary tuberculosis who were treated solely with isoniazid. Both deaths occurred during the first week of therapy. In the remaining 12 of the isoniazid-treated acute miliary group, the institution of therapy was followed by a uniform disappearance of clinical illness, regression of roentgenographic abnormalities, and a high incidence of reversal of infectiousness.

A comparison of the uniformly satisfactory results in the isoniazid-treated uncomplicated miliary infections with the results previously obtained in this clinic with streptomycin permits the inference that the antituberculous activity of isoniazid in man is the equivalent, and probably slightly the superior, of the antituberculous activity of streptomycin.

Additional evidence of the antituberculous activity of isoniazid was provided by the results obtained in certain meningeal infections. (Am. Rev. Tuberc., Oct. 1952, C. M. Clark, DuM F. Elmendorf, Jr., W. U. Cawthon, C. Muschenheim, and W. McDermott)

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The Newer Treatments of Intrinsic Asthma

Intrinsic asthma has been a bugbear to most allergists as it defies definition almost as much as it defies treatment. Bacterial infection or sensitization is believed to be the cause. In most cases, a chronic cough has existed for many years before the onset of the wheezing so that individuals with this condition are generally past middle age. While the asthma may be paroxysmal, it is usually intractable as well. The patient with extrinsic asthma infrequently has irreversible changes in the lungs while the patient with intrinsic asthma almost always does.

A base line is present in all patients with asthma. When respiratory difficulty rises above this line, clinical asthma is present. In extrinsic asthma when respiratory difficulty is below this base line, there are no symptoms of asthma although wheezing may be detected with the stethoscope. In intrinsic asthma, the base line is much lower so that asthma is present almost constantly accompanied by productive cough, wheezing, and dyspnea. Pulmonary emphysema is practically always present. When respiratory symptoms become severe, there is an attack of paroxysmal asthma similar to that in extrinsic asthma. Any infection of the respiratory tract will bring on increased severity of respiratory symptoms and paroxysmal asthma.

Severe, though usually transient, attacks of asthma are precipitated by exertion, exposure to a cold wind, or even by change of position. Productive cough then gives definite but incomplete relief.

An increase in severity of the asthma usually takes place several times every 24 hours. Without exertion or exposure to cold, these generally take place at night, on first retiring, after sleeping variable periods, and on arising. Again some relief is gained each time by productive cough. While asthma is present perennially, it is worse during the winter and in damp weather. Geographic location is important because of this.

Due to the mentioned irreversible changes in lung structure and the very chronicity of the condition, treatment has been both specific and symptomatic.

There have been many arguments about the specificity of skin tests with bacterial extracts or filtrates, stock or autogenous. Most all allergists use vaccines of one kind or another but results have been far from conclusive perhaps because of the very nature of the disease. In the last 3 years, the author has been using a stock vaccine made from 18-hour cultures of organisms obtained during bronchoscopy on patients having asthma.

Full strength of this vaccine is 1% by volume and then cut to 0.5% by glycerine for storage under refrigeration. Treatment is started with 0.05 ml. of 1:1,000 dilution of the concentrate or more dilute depending on the local reaction to intradermal test with this dilution. Increases are made gradually until there is improvement, at which time the dose is held at that level and time between injections lengthened. Failing improvement,

the author has given as much as 0.5 ml. of the 1:10 dilution. This vaccine has brought on attacks of asthma several hours later, but otherwise, there have been no constitutional reactions.

Autogenous vaccines have not given satisfactory results in most cases, whether intradermal tests resulted in immediate, delayed, or no reaction.

Nonspecific treatment is discussed under pyromin, antibiotics, aerosols, bronchodilators, mercurials, and expectorant medications.

Many of the newer drugs used in the treatment of intrinsic asthma are discussed. Some have value but will not alter the irreversible lung changes. While some temporary relief may be given, the patient must learn to live with his intractable asthma. Prophylaxis in preventing acute bronchitis from becoming chronic will hinder the development of pulmonary emphysema and intrinsic asthma. (Ohio State M. J., Oct. 1952, S. W. Simon)

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Shock in Botulism Treated With Dextran and Blood

Botulism is a type of food-poisoning caused by the toxin of Clostridium botulinum. Under normal conditions it is rare. The mortality from botulism is high, averaging 50% according to published reports, but it varies. In the United States there have been some severe poisonings caused by Cl. botulinum type A. In France, on the other hand about 1,000, mainly caused by type B, were reported during the occupation, with a mortality of about 2%.

The treatment consists in the injection of the type-specific antitoxic serum; the administration of antibiotics; feeding through a duodenal tube; the parenteral administration of fluid, glucose, and electrolytes; and the administration of oxygen, clearing of the pharynx and bronchi, tracheotomy, and treatment with a mechanical respirator as the case indicates.

A small family epidemic was treated for botulism in the autumn of 1951. Four of the six patients were in severe shock on admission. These 4 patients received dextran and blood transfusions, apparently with a favorable result. Because shock has not been emphasized previously as a sign in this disease, the authors' experience is reported.

The principal symptoms were severe weakness, dryness of the mucosae, and visual disturbances. Four patients were in shock on admission, 3 had dysphagia, and 2 had slight air-hunger on swallowing, but none developed pharyngeal or respiratory paralysis. One patient had attacks of laryngeal spasm, and another tonic convulsions in his limb muscles, with tetany position of the hands.

Although the disease was benign in that pharyngeal or respiratory paralysis did not develop, 4 patients were severely affected by the initial shock. The brief incubation periods (12, 18, 16, 19, 20, and 20 hours) also indicate severe poisoning. All the patients survived.

Electrocardiograms showed temporary depression of the T waves in 5 cases. These abnormalities occurred from the seventh to the twelfth day of illness. During the first 7 days the patients had slightly reduced serum potassium levels.

The patients' shock on admission was striking. They were pale, weak, and cool, with low blood pressure and fast pulse rate. A table which shows that the infusions of dextran and blood produced much improvement in blood pressure, pulse, and general condition, is presented. The authors believe that shock is common in severe botulism, and that it is caused by direct action of the toxin on the organs regulating the circulation. They recommend blood transfusion and believe that the symptomatic treatment should be on the lines prevailing at present in other neurotoxic poisonings, such as barbituric acid poisoning. (The Lancet, Sept. 20, 1952, J. Pedersen and A. Christensen, Copenhagen, Denmark)

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Acute and Chronic Viral Hepatitis

The importance of viral hepatitis in present-day medical practice may be gauged by the fact that the Cumulative Index lists almost 1,000 articles on the subject published during the past 10 years. Medical interest has been inspired in part by the fact that hepatitis constituted the most important single disease of World War II, overshadowing in importance malaria, the dysenteries, and such viral diseases as influenza. It has been estimated that at least 250,000 men in the American forces had hepatitis at one time or another during the war years; this includes both the naturally occurring disease and that which was transmitted through accidental innoculation with infected serum. The problem did not end with the war; more than 4,000 patients with viral hepatitis have been treated at the Hepatitis Center at Bayreuth in Germany since then and the disease has been extremely common in our forces in Japan and Korea. In the civilian world there are few communities which have escaped contact with the disease, and many local epidemics have been recorded.

There is not the slightest evidence that any drug, antibiotic, dietary formula, lipotropic substance, vitamin, or other agent has any certain effect on the course of chronic viral hepatitis, or indeed on the acute forms. Gertzen has recently shown that with a caloric intake of about 3,000 calories a day the relative proportions of fat, protein, and carbohydrate in the diet make no difference in the course of acute hepatitis. The importance of feeding patients must be generally admitted, since it has been shown repeatedly that a poor diet tends to add to the gravity of the situation. There are at least 2 statistical studies which indicate the lack of value of methionine or other lipotropic agents. In other words, except for the public health aspects of the disease, one can do little for a patient with hepatitis except to see that he obtains rest and a proper diet.

It is natural that both the newer antibiotics and the steroid hormones should have been tried in an attempt to influence the course of chronic progressive viral hepatitis. Rarely one or the other of these substances seems to be of some value. There is one well-documented case in the literature in which the persistent use of aureomycin seemed to bring about the cure of a progressive chronic hepatitis. The writer knows of other instances in which this drug has caused a short remission. In the main, however, clinical experience with antibiotics has been disappointing.

Both ACTH and cortisone have been used in the treatment of chronic progressive hepatitis as well as during the course of the acute disease. There seems to be no doubt that these hormones will effectively mask the clinical phenomena during the course of acute disease, but once the drug is discontinued, there is a speedy return to the former status of the patient. In this respect the results are similar to those seen in the treatment of rheumatic fever. The author has known 1 or 2 patients who have made some improvement with the steroid hormones, but unfortunately the period of improvement is not sufficiently long to warrant any conclusions as to its permanence.

The patient with the acute disease should be kept at bed rest until the serum bilirubin falls below 3 mg. per 100 cc. (or until the icterus index is 15 or less). In hospital practice or in the home, typhoid precautions are advisable; if this is not feasible, one can at least insist on a high standard of cleanliness in respect to hands, dishes, hospital utensils, and bed linen. If pregnant women, young children, or ailing old people are in contact with the disease, or if an epidemic threatens, as was the case during the 1951 Kansas City floods, human globulin prophylaxis is strongly advised for all contacts. A dose of 0.01 ml. per pound of body weight confers an active-passive immunity, as Stokes has recently shown.

Physicians are responsible in part for the dissemination of serum hepatitis and should strive to correct any office or hospital practice which may tend to spread the disease. A high grade of care is needed in regard to the office sterilization of instruments; multiple doses of parenteral medication should never be given from the same syringe; syringes and needles should be individually autoclaved.

Plasma should only be used if the advantages of giving it clearly outweigh the risk. If possible, single units from individual donors should be used. Too much reliance cannot be placed on the harmlessness of ultraviolet irradiated plasma. Researches on plasma substitutes, on the sterilization of plasma, and on the production of an immune globulin are continuing and may eventually solve the problem.

So far as the patient with chronic or residual hepatitis is concerned, it should be emphasized that the recovery rate is high except in the few unfortunate patients who acquire the continuing and progressive type of the disease. They are a minority group and nearly beyond the reach of present therapeutic methods.

For the patient with the minor residues one may recommend continued and painstaking observation, the preservation of data on hepatic function, and, if practicable, liver biopsy to follow the uncertain course of the disease. If statistical studies fail, the cooperative efforts of family physicians may be utilized to collect and pool data which may ultimately be of great value. (General Practitioner, Oct. 1952, A. M. Snell)

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Wood Alcohol Poisoning

An occupational hazard which may result in partial or total blindness, occurs from poisoning by wood alcohol.

Some of the occupations in which workers may be exposed to wood-alcohol poisoning are in the manufacturing of artificial silk, artificial leather, linoleum, boots and shoes, antifreeze, colors and chemicals, explosives, varnish and shellac, rubber, felt hats, artificial flowers and hats; workers may also be exposed in dyeing fabrics, cleaning metals, and polishing.

Handling wood alcohol may cause local inflammation of the skin or some absorption of the poison, but the chief danger is in breathing the fumes. When the poison is absorbed rapidly and in large amounts, it strikes at the nerve tissues and often results in acute or even fatal intoxication. If the worker recovers, he may suffer partial or total blindness. Wood-alcohol poisoning on the job, however, is usually chronic, the result of breathing small amounts of the fumes over a period of time. The poison accumulates in the tissues and is difficult for the body to throw off. The extent of injury depends on how promptly the condition is detected and the hazard is controlled.

Although the symptoms of wood-alcohol poisoning may also be produced by other poisons, the most characteristic symptom of wood-alcohol poisoning is blindness. Some of the other symptoms are: irritation of the nose and throat, headache, dizziness, drowsiness, loss of consciousness, convulsions, mental disturbance, impaired eyesight, vomiting, chills, subnormal temperature, and irregular heart action.

All cases of wood-alcohol poisoning should be reported to the State health department, so that the condition may be corrected and other workers protected.

Employers can eliminate a good deal of the hazard by informing all workers of the possible dangers of wood-alcohol poisoning, the protective measures taken, and the proper first-aid treatment. Providing personal protective equipment for workers who must actually handle the compound is essential, as is good general workroom ventilation.

If possible, processes using wood-alcohol should be isolated or enclosed with provisions for local exhaust ventilation at the point of origin.

Employers should provide adequate medical supervision for workers who may be subjected to the hazard and encourage them to report any conditions which they suspect to be dangerous, or any symptoms of poisoning. Employers should thoroughly investigate all such reports, and make certain that all illnesses resulting from exposure to wood alcohol are promptly treated. No one who has been affected by the poison should return to work until he has completely recovered.

Workers can help themselves by remembering that early treatment may prevent serious disability from wood-alcohol poisoning. Wood alcohol in any form should not be taken internally and because use of alcoholic beverages may increase susceptibility to wood-alcohol poisoning, workers should avoid their excessive use. (Occupational Health, Oct. 1952, M. Wukasch)

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Pericardial Cysts

This article calls the attention of roentgenologists to a group of abnormalities whose characteristic roentgenologic feature is a cystlike shadow inseparable from the heart and pericardium, organizes the presently scattered information into a classification of cysts of the pericardium, and discusses the important roentgenologic aspects of certain of these cysts.

The opportunity to observe 5 patients having a cystic shadow inseparable from the heart stimulated interest in the present status of knowledge concerning this abnormality. These cases were studied in the routine work of a private radiologic practice over the past 2 years and one of the cases was studied by angiocardiography with subsequent removal of the cyst and histopathologic study of the specimen.

A classification of cysts of the pericardium based on the pathologic anatomy is offered as follows: (a) True cysts divided into congenital and acquired types. Under the congenital types are placed pericardial celomic cyst, cystic lymphangioma, bronchial cyst, and teratoma; under the acquired types are cystic hematoma, neoplastic cyst, and parasitic cyst; (b) pseudocysts, under this classification are placed pericardial diverticulum and encapsulated pericardial exudate.

A proved case of lymphangiomatous cyst of the pericardium is reported. The cyst was studied thoroughly by the roentgen method (including angiocardiography) and was successfully removed at operation.

Four cases showing cystlike shadows inseparable from the heart-pericardial shadow, but not proved histopathologically, are reported. Two of these fulfill the roentgenologic criteria of lymphatic cyst of the pericardium and 2 fulfill the criteria of true diverticulum of the pericardium.

The roentgenologic aspects, differential diagnosis, and technical procedures helpful in the detection, examination, and interpretation of thin-walled cysts inseparable from the heart and pericardium are discussed in detail.

The importance of thorough roentgenoscopy of the heart, supplemented by spot roentgenograms, in the demonstration of these abnormalities is emphasized.

A proved case of primary thymic tumor (lymphosarcoma), which was roentgenologically indistinguishable from pericardial cyst, is reported. (Am. J. Roentgenol., Oct. 1952, LT. COL. W. M. Loehr, MC, USAR)

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Blood Replacement and Gastric Resection for Massively Bleeding Peptic Ulcer

During a 5-year period beginning in January, 1947, the authors tested a plan of treatment for acute severely bleeding peptic ulcer consisting of immediate blood replacement and concurrent gastric resection, the gastric resection being the standard definitive type. The plan of management was based on the following concepts: (1) Gross bleeding from peptic ulcer is a dangerous complication. (2) It is difficult to determine when bleeding has ceased or whether it will recur. (3) The longer anoxia from acute hemorrhage goes uncorrected, the graver the prognosis. (4) The diagnosis of gross bleeding from peptic ulcer can usually be made with reasonable accuracy. (5) Surgical arrest of such bleeding is feasible. Preliminary reports from the study have appeared previously, and in substantiation of these an analysis of the broader experience is offered.

Definite criteria for the selection of cases were adopted at the outset and these have been adhered to throughout the study. The critical considerations were the acuteness and severity of the hemorrhage, the severity being determined in every instance by immediate measurement of blood volume and other laboratory studies. The criteria were as follows: (1) The patient had shown gross evidence of bleeding into the upper gastrointestinal tract within 1 week. (2) The total circulating red blood cell mass was reduced to less than 60% of normal. (3) There was reasonably good clinical evidence for the diagnosis of bleeding peptic ulcer.

When these requirements were met, blood replacement and gastric resection were carried out with as little delay as possible, most of the blood being given during the operation. If the patient showed a less severe blood loss and the total circulating red cell mass was over 60% of the expected normal value, a supportive regimen consisting of blood transfusions, feeding, nasogastric suction, antibiotics, and rest was instituted. If evidence of bleeding continued the blood volume determination was repeated at intervals of 12 to 24 hours until recovery occurred, or until the criteria for operative treatment were met.

The operation performed in nine-tenths of the cases was an 80% Hoffmeister type of gastric resection with antecolic anastomosis, such as was routinely employed under less urgent indications. The technic had to

be varied, of course, in cases of marginal ulcer and in a few extensive duodenal ulcers. In the case of gastric ulcer the lesion was always removed, even though total gastrectomy was required. However, in 23 cases of duodenal ulcer, the size of the ulcer and extent of surrounding reaction led the surgeon to decide to exclude the ulcer by proximal section, care being taken to remove all the gastric mucosa before closing the duodenal stump. In 4 such instances excision of pyloric mucosa was performed and closure was secured with the muscularis and serosa layers. In many instances it was necessary to evacuate a blood cast from the stomach by initial gastrotomy before it was possible to mobilize the stomach properly for gastric resection.

Immediate blood replacement and subtotal gastrectomy, or a necessary modification thereof, were carried out in a consecutive series of 110 cases, there being 12 deaths.

The average initial total circulating red cell mass was 38.5% of normal, and the average amount of blood given at operation was 2.5 liters; the average age of the patients was 53.5 years and 18 of the patients were over 70 years of age.

Postoperative complications are described and the problem of diagnosis briefly discussed.

If proper facilities are available, fatal hemorrhage from peptic ulcer can be averted by immediate blood replacement and definitive gastric resection.

The surgical treatment which arrests the bleeding is also that which provides best insurance against further manifestations of peptic ulcer. (Ann. Surg., Oct. 1952, J. D. Stewart, G. M. Sanderson, and C. E. Wiles, Jr.)

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Serious Recurrent Injuries of Athletes

Among the problems of health in a student population is a large group of diagnoses concerned with trauma. In the experience at Harvard University these represent over 20% of the total diagnoses year after year. This percentage is inclusive of trauma, whether produced by explosion in the laboratory, by a speeding automobile, or in a friendly "roughhouse." It is generally agreed that the incidence of accidental deaths is too high, but such accidents continue, regardless of rules and regulations and often because of inadequate enforcement of legal safeguards. Quite apart from the over-all trauma found in the routine of daily living is the trauma produced in the organized athletic program.

In a well-organized college athletic program, where coaching and medical supervision work hand in hand, there is little likelihood that the athlete will leave college with some disabling permanent scar, trick knee,

or leg paralysis, as a result of sport primarily played for fun. On the other hand, there are graduates who have lost the spleen or one kidney or one eye because of body-contact sports. Still of interest are the multiple instances of fractures involving the teeth in participants in college sports. In the analysis of reported experience 7,090 cases of athletic injuries in organized competitive athletics, all fractures and dislocations, as well as an injury to any viscus, are considered serious. In a period of 20 years, the serious injuries represented 15% of the total. All injuries recorded were serious enough to require the athlete to refrain from one or more practice sessions or games. Viscus injuries are classified as internal injuries, a group largely represented by cerebral concussion of varying degrees.

Certain injuries to ligaments result in avulsion or complete rupture and require prompt surgical repair, as do injuries to tendon or muscle, which occasionally result from athletic trauma. Although sprains and strains rarely cause such extreme damage to tissue, this effect is periodically observed. Widening of the mortise of the ankle joint and internal derangements of the knee are more common than used to be considered possible. All such injuries today are viewed as cause for surgical intervention to correct the resulting joint dysfunction.

The 15% of the total number of athletic injuries involving fractures, dislocations, and internal injuries are the concern of all college health departments. Fortunately, with this age group and with increased technical skills available at most colleges, long-bone fractures heal well and in good alignment. However, fractures into joint surfaces or through growing epiphyses may result in disabilities. Elbow dislocations promptly reduced, but inadequately treated in convalescence, cause myositis ossificans and serious joint dysfunction. Shoulder dislocations permitted to recur more than 3 or 4 times inevitably require surgical intervention, and a dislocated shoulder, previously operated on, if permitted to recur in athletic trauma will result in disaster. An athlete who has had a fracture dislocation requiring surgical intervention should never be permitted to return to body-contact sport but may take up some other type of sport.

In cases of viscus injury, patients who have had to have a kidney or spleen removed should not compete in body-contact sport. Those with large laparotomy or nephrectomy scars should not be permitted to expose themselves to the trauma of contact sports. Patients with cerebral concussion that has recurred more than 3 times or with more than momentary loss of consciousness at any one time should not be exposed to further body-contact trauma. The college health authorities are conscious of the pathology of the "punch-drunk" boxer. Just how much one should permit recurrence of cerebral concussion in college athletes is a matter of opinion. In all serious cases one should insist upon complete examination, including lumbar puncture in consultation with a qualified neurologist or neurosurgeon. It is the author's practice to rule out the diagnosis of laceration of the brain

in early cases rather than permit the possibility of such an injury to pass unnoticed. One must rule out skull fracture promptly. In 20 years the diagnosis of fracture of the skull has been made in 3 cases and that of cerebral concussion in 309 cases of head injury; 1 ruptured kidney resulted in prompt and successful surgical intervention, and 2 cases of ruptured spleen have been recognized and the patients operated on successfully.

So far as the contra-indications for further participation in competitive college athletics are concerned, it should be pointed out that in the author's experience there has been no case in which the end result of even the most serious injuries has required the medical staff to forbid competition in all sports. At Harvard 4 sports — crew, swimming, squash, and tennis — are popular among undergraduates, and these are recommended to many of the patients who have previously sustained serious injuries in body-contact sports. Patients with severe, complicated sprains can be maintained in body-contact sports postoperatively with the daily application of protective adhesive strapping, but only if there has been complete functional recovery. Patients with recurrent shoulder dislocations can be maintained in football with a restrictive harness, but body-contact sports should not be recommended if the shoulder has been operated on. Likewise, students with injuries to kidney, spleen, or brain that have required surgical correction or prolonged hospitalization should not be permitted to engage in body-contact sports. The demonstration of the proper type of sport participation rather than the denial of all participation is the proper prescription. (New England J. Med., Oct. 9, 1952, A. Thorndike)

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Triethylene Melamine in Clinical Cancer Chemotherapy

Following the introduction of nitrogen mustard (HN_2) as a chemotherapeutic agent for the management of disseminated malignant lymphomas and inoperable bronchogenic carcinoma in 1943, hundreds of closely related compounds have been synthesized and studied experimentally. Although a small number of these demonstrated certain advantages over HN_2 in the laboratory, clinical evaluation failed to justify their substitution for the commonly employed nitrogen mustard. Recently, however, a related chemical compound has been examined both in the laboratory and in clinical therapy which offers significant advantages over HN_2 in selected cases. This drug, triethylene melamine, is effective after oral administration and the incidence of immediate toxic manifestations is appreciably less than with intravenous nitrogen mustard.

This report summarizes experiences in 44 cases treated during the past 2 years. At the outset it can be stated that the drug does not cure

any malignant disease. Emphasis is placed on the indications, limitations, dosage, and toxicity. The experimental observations which provided the basis for clinical trial have been reported by Rose and Philips, and detailed discussion of the drug in cancer chemotherapy has been presented by Karnofsky et al. and Wright et al.

Triethylene melamine has been routinely administered orally together with 2 gm. of sodium bicarbonate. The drug and the alkalinizing agent are given on awakening in the morning and breakfast is delayed for 2 hours thereafter.

In the authors' experience the addition of sodium bicarbonate to the regimen has made it possible to restrict the dosage range to from 5 to 15 mg. In patients with Hodgkin's disease without bone marrow depression, it is the authors' practice to give 5 mg. of triethylene melamine with 2 gm. of sodium bicarbonate on 2 successive mornings. In the majority of cases this constitutes the therapeutic course. In an occasional patient an additional 5 mg. of TEM may be given 2 weeks later if full therapeutic effect has not been achieved and leukopenia has not developed. The authors have confirmed the observations of Karnofsky that lymphosarcomas and chronic lymphocytic leukemia are particularly sensitive to the drug. For these cases it is customary to give 2.5 mg. with bicarbonate on 2 successive days.

The rationale for administration of sodium bicarbonate simultaneously with triethylene melamine is presented, together with evidence which indicates that this regimen sharply decreases the variability of effective dosage from one case to another. Triethylene melamine has been employed to advantage in the treatment of patients with malignant lymphomas, chronic leukemias, and bronchogenic carcinoma. The indications for using this drug or nitrogen mustard are discussed.

The toxicity of triethylene melamine in regard to bone marrow function is stressed. One fatality due to overdosage of the chemical compound with resulting pancytopenia is reported.

In appropriately selected cases and with full recognition of the potential toxic hazards triethylene melamine may be employed as an additional useful cancer chemotherapeutic agent. (Am. J. Med., Oct. 1952, A. Gellhorn, M. M. Kligerman, and I. Jaffe)

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"Untreated" Bronchogenic Carcinoma

The natural course of tumors of a designated type and site is the best yardstick for evaluating the effects of definitive therapy in tumors of like kind and origin. When such data become available, it will not be necessary to wait a specified number of years (e.g., 5) in order to determine the comparative effectiveness of any given method of treatment. In any case it is wasteful to wait as long as 5 years when one deals with tumors as apt

to be rapidly fatal as bronchogenic carcinomas, even though a few patients sometimes live several years after the diagnosis has been established. For these occasional cases, data based upon total biologic behavior are as valid as those obtained by following groups of patients for a set term of years, unless that term is longer than the survival period of the exceptionally long-lived few. The practice of administering one of the recently discovered chemotherapeutic agents for inhibiting the growth of tumors and/or palliative x-ray therapy is so nearly universal that it is becoming increasingly difficult to find groups of cases of untreated cancer.

The author's material was selected from the records of 906 necropsies at the Veterans Administration Hospital, Louisville, Ky., from April 1, 1946 to December 31, 1951. During this period there were 1,509 deaths in the hospital. The 35 cases constitute 11.4% of 305 malignant tumors, and 55.55% of the bronchogenic carcinomas in the authors' necropsy material.

The viscera were examined and sectioned in all but 6 instances. The brain was removed only when there was some suspicion of an intracranial lesion. Tissue sections were prepared from the somatic organs in every case, even though they appeared normal when examined grossly. Additional sections were prepared, when this seemed advisable, from wet stock material saved routinely at every necropsy. The clinical records of all cases of bronchogenic carcinoma in the necropsy material were scrutinized carefully so as to exclude any in which definitive therapy has been instituted. In addition to several which had been treated more actively, 4 cases were discarded because palliative x-ray therapy had been administered terminally to 2 patients, and the other 2 died less than 2 months after undergoing exploratory thoracotomy. An exploratory thoracotomy was performed in 10 of the 35 patients selected for this study. However, the operative procedure was not extensive in any, and was followed by prompt recovery in all. There was nothing to indicate, either clinically or pathologically, that the operation shortened the life of any of these patients, all surviving 8 months or more. The remaining 25 patients were not operated upon. All 35 received transfusions of whole blood and antibiotics, as indicated for anemia or infection, respectively.

The bronchogenic carcinomas in this series were divided into 5 groups, according to their histologic appearances; epidermoid, anaplastic, adenocarcinoma, mixed epidermoid and adenocarcinoma, and terminal bronchiolar. Significant differences were demonstrated in the behavior and course of epidermoid carcinomas, as contrasted with those of anaplastic type.

The epidermoid carcinomas, in this series, arose more insidiously, grew more slowly, and started at a later average age than the anaplastic. The epidermoid carcinomas electively metastasized to the regional lymph nodes but also spread diffusely. Five or more organs were involved in 7 of the 18 cases in this series. The suggestion is advanced that this was due to prolonging the life of the host by transfusions of whole blood and use of antibiotics, thus affording the epidermoid tumors more time and a better opportunity for distant spread.

The anaplastic carcinomas started at an earlier average age than the epidermoid. They often rose "explosively," invaded the adventitia of the thoracic aorta, and metastasized to the pancreas and adrenal glands by way of the celiac axis and other branches arising from the aorta. They also electively metastasized to the brain.

Presenting symptoms were not sufficiently distinctive to permit differentiation of bronchogenic carcinoma from common pulmonary disease due to other causes. The triad of fever, leukocytosis, and anemia, occurring in cycles, and a change in the nature of a cough are significant symptoms suggestive of bronchogenic carcinoma.

Histologic examination of tissue taken for biopsy and prepared by frozen section technic may be of considerable prognostic value in determining whether a radical resection offers hope of cure.

The demonstration of metastases in the regional nodes, in cases of epidermoid carcinoma, is not necessarily an indication of incurability. With anaplastic carcinomas, attention should be directed to evidence of invasion of the adventitia of the thoracic aorta. If present, the probability of involvement of the pancreas and/or adrenal glands is increased materially. (Am. J. Path., Sept-Oct. 1952, G. R. Tanner and H. Gordon)

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Stigmonene Bromide in the Diagnosis of Early Pregnancy and the Treatment of Simple Delayed Menstruation

For a long time it has been known that women subject to mental, emotional, or physical stress may experience temporary delay in menstruation. It has also been shown that this type of amenorrhea can be relieved promptly by the administration of parasympathomimetic drugs. Much of the mechanism underlying this peculiar type of amenorrhea as well as the mechanism of its relief by cholinergic compounds remains unexplained, although the evidence indicates that the autonomic nervous system is involved. The relationship of stress to the parasympathetic nervous system is well known, but the connection between this system and menstrual bleeding is not clearly understood.

The prompt onset of bleeding in nonpregnant women and the absence of this response in pregnancy with the use of cholinergics constitute an economical, highly accurate test for pregnancy that can be done as an office procedure. As a therapeutic measure in simple delayed menstruation it is ideal, since many women, even though informed that their biological test for pregnancy is negative, will not be psychologically at ease until menstruation is reestablished.

In view of these considerations the present study was undertaken for the purpose of evaluating the efficacy of a new cholinergic preparation, Stigmonene Bromide, as a treatment for simple delayed menstruation and a diagnostic measure for early pregnancy.

Stigmonene Bromide (1-benzyl-3-(dimethylcarbamyloxy)-pyridinium bromide) is a synthetic alkaloidlike salt of the quaternary pyridinium series. Pharmacological investigations demonstrated that Stigmonene acts as an inhibitor of the enzyme cholinesterase and is less toxic than compounds of the physostigmine group. Clinically, in both prophylactic and therapeutic use it was not attended by side effects.

A total of 116 women complaining of delayed menstruation were selected for this study. Early in this study it became apparent that certain requirements had to be met if reliable results were to be obtained. These requirements are: (1) no menstrual irregularity prior to the present complaint; (2) no evidence of the menopause; (3) no organic pelvic disease; (4) no causative endocrine or constitutional disturbance.

Of the original 116 patients, 100 met the afore-mentioned requirements. The remaining 16 patients in addition to their original complaint showed evidence of either organic pelvic disease, endocrine dysfunction, or the menopause. However, they have been included in this report to emphasize the importance of observing the limitations of the test.

Each patient's diagnosis was based on a carefully taken history, physical examination, and pelvic examination. All women were given the Aschheim-Zondek test (Friedman modification) for pregnancy. Each patient received an intramuscular injection of 1 cc. of a 1:1,000 solution (1 mg.) of Stigmonene Bromide on each of 3 successive days. If the menstrual flow was reestablished with the first or second injection, further treatment was discontinued. On the other hand, a patient was presumed to be gravid if no bleeding ensued after the third injection. All participants were informed of the possible effects the treatment might produce and were instructed to report the start of the menstrual flow or any symptoms of drug reaction.

In the 100 patients who met the requirements for the test and who received 1 mg. of Stigmonene intramuscularly in 1 cc. doses on each of 3 successive days, the drug did not evoke the menstrual flow after the third and last injection in 83 instances. These women were therefore considered to be gravid. The average number of days overdue in this group was 28.3. The diagnosis of pregnancy was established clinically in each of these cases. In all but one instance pregnancy was confirmed by the Aschheim-Zondek test (Friedman modification). This patient, whose clinical pregnancy was established beyond doubt by the presence of fetal heart sounds, had a biological test for pregnancy that was performed 43 days after her last menses and was reported as negative.

It was necessary in 4 instances to repeat the Aschheim-Zondek test in order to reconcile the results with those obtained by the single course of 3 Stigmonene injections and the clinical evidence of pregnancy, although these women were overdue from 3 to 8 weeks. The Stigmonene-diagnosed pregnancies proved to be 100% accurate in the group of 83 patients who met the requirements of the test.

Of the 17 remaining cases in the series, 16, who were amenorrheic for an average of 20.1 days, were considered not pregnant clinically. They had negative Aschheim-Zondek tests and bled in from 2 to 120 hours following the last injection. The majority (88.2%) menstruated within 96 hours. The remaining patient in this group was first seen when her menses were 13 days overdue. Pelvic examination revealed a third degree retroversion of the uterus. It was also slightly enlarged and boggy. Three injections of Stigmonene were given. Ten days later an Aschheim-Zondek test was reported as negative but no bleeding had occurred. An Aschheim-Zondek test repeated 12 days later was reported as positive and the following day bleeding began and continued for 3 days. Subsequent pelvic examination was normal except for a persistent third-degree retroversion of the uterus. Whether the patient was originally pregnant and the biological test in error or whether she became pregnant later, and the Stigmonene test was in error cannot be stated definitely. But she was considered as nonpregnant and the Stigmonene test in this instance a failure. Nevertheless, the efficacy of Stigmonene as a therapeutic measure in this series of 17 cases reached 94.1%.

The Stigmonene Bromide test for early pregnancy proved to be both highly accurate and harmless to gestation. Preliminary investigation of the use of Stigmonene Bromide in the treatment of simple delayed menstruation indicates that the drug is effective if certain discussed limitations are observed. No instance of drug reaction or sensitivity was encountered. (Am. J. M. Sc., Oct. 1952, E. N. Bookrajian and W. Truter)

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Resilient Plastic Interdental Splint

As a safeguard against the possibility of injury to the teeth and jaws, it has been the practice of boxers, some football players, and other athletes, to wear a standard rubber mouthpiece while engaging in their athletic activities. This stock appliance is "as ancient and as ineffective as a square wheel." Its shortcomings manifest themselves in (1) poor retention with resultant ease of dislodgment; (2) impairment of breathing, or even aspiration into the throat; (3) increased muscular distress and possibility of damage to the temporomandibular articulation, because of increased vertical dimension beyond tolerable limits for prolonged periods of time; and (4) the impossibility of talking or of calling signals, as a quarterback is required to do.

In the hope of reducing the incidence of chipped or knocked-out teeth during athletic events, the Maxillofacial Prosthesis Section of the United States Naval Dental School, Bethesda, Md., has developed an improved mouthpiece made of resilient vinyl resin. It fits snugly against the teeth and soft tissues, and therefore is not easily dislodged. At the same time, the wearer can talk or call signals with but little if any impairment of

speech. The increased vertical dimension is within normal tolerable limits. The pressure of normal occlusion and likewise the force of a blow is distributed to all of the teeth. It is also being used to treat bruxism and cheek biting. (U.S. Armed Forces Med. J., Apr. 1952, J. V. Niiranen and H. J. Towle)

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Dental Amalgam: The Effect of Mechanical Condensation on Some Physical Properties

In view of the widespread popularity of various types of mechanical condensers, the investigators at the National Bureau of Standards believe that mechanical procedures should be compared with the usual hand technics. In the study undertaken, a total of 6 procedures was employed——3 hand condensation technics, and 3 mechanical condensation technics. The latter included 2 mechanically actuated types, and a pneumatic mechanical condenser. Employing these technics, specimens were prepared for the following tests: compressive strength, dimensional change, microstructure, and mercury content. Two alloys were used and each amalgam was triturated in a mechanical amalgamator.

The results revealed only a slight superiority in the compressive strength of mechanically condensed specimens. Mechanical condensation caused a higher early, and a higher final, compressive strength, with some variations evident in alloy brand, and in individual manual and mechanical technics. It was interesting to note that the pneumatic mechanical condensation technic gave results which compared closely to those given by the 3 manual types of condensation.

Though the significance was not observed clinically, it was found that the 2 mechanically actuated condensers produced only slight expansion, or even a shrinkage, as compared with the expansion in specimens which had been condensed by the pneumatic mechanical condenser and by hand condensation.

The study of the microstructure and mercury content of numerous specimens produced no conclusions regarding a relationship between compressive strength and dimensional change. (J. Am. Dent. A., Sept. 1952, G. Ryge, G. Dickson, D. L. Smith, and I. C. Schoonover)

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The printing of this publication has been approved by the Director of the Bureau of the Budget, June 23, 1952.

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Fluid Exchange at the Margins of Dental Restorations

It has long been desired that all dental restorations be meticulously adapted to the margins of the cavity. In spite of the greatest care, one can never be completely assured that the desired restoration is obtained when temperature variations in the mouth can cause the restoration to change in volume at a different rate from the tooth in which it is placed. Only with amalgam has an effort been made to compensate for the difference in thermal expansion or contraction.

Because the coefficient of thermal expansion of the direct resinous filling materials is known to be approximately 7 times that of tooth structure, it seemed probable that the marginal seal of the filling would be lost by certain thermal changes in the mouth. Chilled extracted teeth and their restorations which had been stored in water were found to extrude small droplets of fluid at margins, as the return to body temperature was accomplished. This percolation of fluid occurred at the same position at the margins following each chilling cycle, regardless of brand, cavity preparation, or method of placement.

Other types of filling materials were also observed for marginal percolation, namely: gold inlay, gold foil, amalgam, silicate cement, gutta percha, and zinc-oxide-eugenol. In each instance fluid was seen to form as droplets at the margin. Many of these restorations were those of cooperators throughout the country. A difference was noted, however. The restorations of gold, amalgam, and cement appeared to be associated with less volume of percolation.

Extracted teeth containing amalgam restorations which had been in place for some time prior to extraction, did not appear to produce percolations. It is possible that corrosion products of the amalgam may choke the minute discrepancies with a bacteriostatic plug, and therefore inhibit fluid exchange. In a like manner, the investigators suggest there may be a possible explanation for the recurrence of caries at the margins of some restorations where the minute fluid exchange does not work to advantage. In this regard, the direct resins have 3 properties which may affect their value as a permanent filling material. These are (1) their polymerization shrinkage of from 6 to 8% by volume, (2) their thermal expansion, which is more than 7 times that of tooth structure, and (3) their extreme inertness in mouth fluids. (J. Am. Dent. A., Mar. 1952, R. J. Nelsen, R. B. Wolcott, and G. C. Paffenbarger)

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Kutapressin in Cystic Acne

A preliminary report of the use of Kutapressin in cystic acne vulgaris has been received from the Dermatologist of the 3380th Medical Group, Keesler Air Force Base, Miss.

One hundred and ten patients who have been under treatment for from 2 weeks to 5 months are reported in this series.

Because the evaluation of a new drug is difficult, the author used only a minimal supportive regime consisting of: (1) the skin was scrubbed 3 times daily with phisoderm or sulphur soap; (2) the patient was instructed to shampoo his hair twice a week and to use no hair oil, and (3) the patients were given a list of foods rich in fats, to avoid. In addition all patients were instructed not to tamper with any lesion. Acne surgery was performed when necessary and systemic antibiotics were prescribed when indicated. No hormones, vitamins, lotions, ultra-violet light, or x-ray were used.

In determining the response of acne to Kutapressin the cases were graded from O to XXXX. O, unchanged by therapy, 7 cases or 6%; X, very slight improvement, 8 cases or 7%; XX, both patient and observer noted definite improvement, 32 cases or 30%; XXX, excellent response to therapy, with only occasional new lesions, 41 cases or 37%; XXXX, no new lesions (or very rare new lesions) and the patient could be considered controlled, 22 cases or 20%.

The dosage given varied from 1 to 2 cc. IM 3 times a week to 1 to 2 cc. IM daily. It is doubtful if the drug is very beneficial when less than 1 cc. twice weekly is given. Improvement is usually obvious in 2 to 3 weeks after therapy is begun.

In this project the author is attempting to determine if Kutapressin is of value in the treatment of cystic acne. He is not attempting to establish an optimal dosage schedule or to gather data on recurrence after discontinuance of therapy.

The study is being carried out under the supervision of the civilian consultant who is also using Kutapressin in his private practice. To date his results are similar to those presented. A report on this experience will be submitted for publication when completed.

The author's detailed report will also be submitted for publication in the near future. (See Medical News Letter, Vol. 20, No. 1, 25 July 1952) (CAPT. J. M. Knox, USAF (MC))

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Aero Medical Association

Leading aviation medical scientists from 8 nations attended the interim meeting of the Aero Medical Association in Paris, September 26, 27, and 28th, held under the auspices of the French-speaking Branch of the Association. The extensive scientific program which covered all current problems in aviation medicine was arranged by a committee under the chairmanship of Dr. Armand Robert, Medical Director of Air France and Secretary of the Branch.

Major General Charles Sillevaerts, former chief of the Belgian Air Force Medical Service and vice chairman of the Belgian Aero Club, was elected president of the French-speaking Branch to succeed Professor Leon Binet. The new vice presidents are: Dr. Paul Garsaux, President of the French Medical Council for Civil Aviation, Major General F. A. Clerc, Inspector General of Aviation Medicine for the Ministry of National Defense of France and former Surgeon General of the French Air Force, Major Klaus Wiensinger, Chief of the Institute of Aviation Medicine of the Swiss Air Force, and Commandant Edgard Evard, Chief of the Belgian Air Force Medical Service. Dr. Andre Allard, medical director of Sabena Airlines was elected secretary, and Brussels was named the site of the next meeting of the Branch to be held in September 1953.

The meeting was formally opened in the grand amphitheater of the Faculte de Medecine de Paris with an address by Dr. W. R. Stovall, president of the Aero Medical Association, and a response by General Beyne on behalf of Professor Binet. At an official reception at the Hotel de Ville, on the second day of the meeting, engraved scrolls designating the recipient as a "friend of Paris" were presented to Dr. Stovall, Major General Harry G. Armstrong, Surgeon General of the Air Force, Rear Admiral B. Groesbeck, Jr., President-elect of the Association, Colonel Gustave Severin, Surgeon General of the Royal Swedish Air Force, Colonel George B. Green, USAF (MC), Assistant Air Attache in Paris, Lt. Colonel W. L. Nolke, Assistant Medical Director, Royal Netherlands Air Force, and Dr. Andre Allard, Medical Director of Sabena Airlines.

Fifty-four papers which covered the broad field of aviation medical practice and research in the French-speaking countries were read at the meeting. Following each speaker, a translator gave a summary of the presentation in English. Likewise, all questions and discussion was given in both English and French. The meeting and program will be reported in an early issue of the Journal of Aviation Medicine. (COL. R. J. Benford, USAF (MC))

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Thromboplastin Ampuls Withdrawn

Stock Number 1-613-005 Thromboplastin Ampuls, 50 mg. (3/4 gr.), 12s, has been withdrawn from issue by Naval Medical and Dental Supply Depots and is being deleted from the Armed Services Catalog of Medical Materiel. It has been determined that this item is not dependable in prothrombin time determinations, and that the resulting inaccuracies provide a hazard in the use of Dicumarol.

This item has been replaced by Stock Number 1-613-050 Thromboplastin Extract, 20 Tests per Bottle, 10s, which is an improvement over Thromboplastin Ampuls, Stock Number 1-613-005, in storage stability and dependability as a testing material.

Initial requisitions for the Thromboplastin Extract (Simplastin) should be as conservative as estimated requirements will permit. Immediate requirements may be met by local procurement.

On hand quantities of Stock Number 1-613-005 Thromboplastin Ampuls should be surveyed and destroyed in accordance with Article 25-21 Manual of the Medical Department. (Plan. Div., BuMed)

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Unnecessary Retreatment of Syphilis

Dr. Evan Thomas, Bellevue Hospital, reported before the recent Venereal Disease Seminar of Regions III, VI, and VIII of the U. S. Public Health Service on follow-up observations on syphilis which remains sero-positive after an adequate course of treatment. A series of several hundred cases of latent syphilis were treated with penicillin, and followed until they became sero-negative. Some were retreated one or more times after a year of persistently positive serologic tests for syphilis. In this group the eventual return to sero-negative status was not hastened in the slightest degree over a comparable group who were followed without additional treatment.

Dr. Thomas believes that persistence of reagin in the blood of latent syphilis cases for more than 1 year after treatment is to be expected, and is not evidence that the initial treatment was a failure, and no indication that treponemes have survived the initial treatment. For latent syphilis cases, one course of treatment with penicillin, if adequate in amount and duration (the Navy's recommended schedule is more than adequate) should be followed by quantitative serologic tests for an indefinite period. Return to negativity has occurred after 5 years. Retreatment should not be considered necessary in the absence of rising STS titers or signs of relapse. Reinfection is possible at any time that immunity has fallen to ineffective levels.

Rule: Given a case of latent syphilis, treat with only one course of penicillin. Follow with titered serologic tests for syphilis, as long as the tests remain positive. It may take several years to become negative. Do not retreat as long as the titer remains low or continues to fall. (PrevMed Div., BuMed)

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From the Note Book

1. Rear Admiral Lamont Pugh, MC, USN, Surgeon General of the Navy was the guest speaker at a meeting of the St. Clair County Illinois Medical Society on November 6, 1952. The subject of the address by the Surgeon General was "The Surgical Treatment of Duodenal Ulcer." (TIO, BuMed)

2. Major General Carl R. M. Fasting-Hansen, Chief of the Danish Military Medical Corps, accompanied by his Chief of Staff, Colonel Johannes Hempbl-Jorgensen and the Chief Physician of the Danish Navy, Commander Mogens Winge, visited Navy Medical Department facilities at Camp Lejeune, October 31, 1952. The visitors, accompanied by Rear Admiral Lamont Pugh, Surgeon General of the Navy, observed and discussed sanitary measures, procedures, and doctrine employed in temporary and permanent type troop installations as taught at the Navy Field Medical Service School located there. (TIO, BuMed)

3. Rear Admiral Clarence J. Brown, MC, USN, Deputy Surgeon General of the Navy, represented the Navy at the meetings of the Executive Council of the Association of American Medical Colleges, November 10-12, in Colorado Springs, Colo.

4. The general principles of abdominal incisions applicable to newborn babies and infants and the technics of specific incisions are discussed in Surgery, Oct. 1952, C. D. Knight and J. W. Kirklin.

5. A report describing a new and rapid method of making sections of frozen tissue on the microtome appears in the American Journal of Pathology, Sept-Oct. 1952, Vannevar Bush and R. E. Hewitt.

6. In 277 cases of pulmonary tuberculosis in which pneumothorax was voluntarily discontinued it appears that pneumothorax collapse of 3 years or longer gives the best results. (Dis. Chest, Oct. 1952, N. G. Trimble, J. L. Eaton, and I. Gourley)

7. Two hundred and thirty-two strains of Coxsackie or C viruses isolated in widespread areas in this country and abroad, from patients, flies, and sewage have been identified by the complement fixation and neutralization tests and classified into 16 different immunologic entities. (J. Immunol., Oct 1952, G. Contreras, V. H. Barnett, and J. L. Melnick)

8. Total pancreatectomy has been reported 27 times to June 1952. An article describing the metabolic studies following total pancreatectomy for retroperitoneal leiomyosarcoma appears in the New England Journal of Medicine, 9 Oct. 1952, G. L. Nardi.

9. A method which uses heavy water to determine the total water content of biological tissues and other materials has been developed by scientists at the Naval Bureau of Standards. (NBS Technical News Bulletin, Oct. 1952)

10. Fractured anterior teeth are classified and the authors present a method of treatment to be applied generally as well as step-by-step

technics for the treatment of each specific fracture. (Dental Digest, Oct. 1952, A. J. Malone, and M. Massler)

11. By the use of the denture gauge the author illustrates the possibilities of restoring in the 3 dimensions the natural position of the occlusal plane and also restoring the natural position and inclination of the maxillary teeth. (Dental Items of Interest, Oct. 1952, R. N. Harper)

12. "The Sanitary Landfill Method of Refuse Disposal in Northern States" and "The Effects of Community-wide Installation of Household Garbage-grinders on Environmental Sanitation", are 2 booklets published by the Public Health Service. These booklets will be helpful in garbage disposal problems resulting from outbreaks of vesicular exanthema among garbage-fed hogs. (F. S. A., P. H. S., 29 Oct. 1952)

13. The U. S. Naval Correspondence Center, Brooklyn, N. Y. announces the availability of courses titled "Naval Arctic Operations" (NavPers 10946) and "Nucleonics for the Navy" (NavPers 10901)

14. The pathology of early retrolental fibroplasia with an analysis of the histologic findings in the eyes of newborn and stillborn infants is discussed in the American Journal of Ophthalmology, Oct. 1952, A. B. Reese, F. C. Blodi, and J. C. Locke)

15. Successful methods of definitive plastic surgery and a procedure plan for the early care of face and jaw wounds are described in the Journal of the International College of Surgeons, Sept. 1952, COL. B. N. Soderberg, MC, USA.

16. Tonography is a new term for a procedure consisting essentially of the observation of the drop in ocular tension that occurs during prolonged or sustained corneal application of a tonometer of the Schiotz type. It may be described as a promising approach to a number of ophthalmologic problems. (A. M. A. Arch. Ophth., Oct. 1952, P. C. Kronfeld)

17. A study of the problems of delivery of the oversized infant indicated that women who gave birth to babies of excessive size are likely to be of somewhat larger stature than average and to carry pregnancy beyond the expected date of confinement. Male infants predominate among larger babies. (Am. J. Obst. & Gynec., Sept. 1952, A. B. Hunt)

18. A case of peripherally located bronchial adenoma with histologic evidence of transformation into adenocarcinoma 6 years following its detection is described in the Journal of Thoracic Surgery, Oct. 1952, CDR. W. Umiker, MC, USN and CAPT. C. F. Storey, MC, USN.

BUMED INSTRUCTION 6150.1 6 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Providing In-patient and Out-patient Treatment

Subj: Clinical records and X-rays of Navy and Marine Corps personnel or dependents thereof; transfer and retirement of

Ref: (a) Art. 23-303 items 605, 617, 629, MMD
(b) Art. 23-302 MMD

1. This instruction establishes a procedure for (a) the transfer of original clinical records and x-rays of Navy, Marine Corps, and dependent patients between naval medical treatment facilities; and (b) the retirement of clinical records of Navy, Marine Corps, and dependent patients. The instruction is effective upon receipt.

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BUMED NOTICE 6130 16 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: Commandants, All Naval Districts (District Medical Officers), Commanding Officer, U. S. Naval Hospitals.

Subj: Clinical boards; processing time of

Ref: (a) SecNav ltr of 12 Sep 1951, Subj: Navy physical disability retirement and separation process

1. Ref. (a) establishes as a goal an average clinical board processing time of not more than 5 calendar days, from and including the date of the board meeting to the date records are forwarded to the physical evaluation board. The average number of days required for April was 4.9 days; for May 7.2 days; for June 6.5 days; for July 7.9 days. Those clinical boards whose average time is above the 5-day maximum shall immediately review their current procedures in an effort to reduce the processing time below the 5-day goal.

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BUMED INSTRUCTION 6820.3 16 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations having Hospital Corps Personnel on Duty Independent of a Medical Officer

Subj: Books, medical, for Hospital Corps personnel on independent duty

1. The 1952 edition of the Handbook of the Hospital Corps will be distributed without request, early in 1953. Until then the following listed books may be requisitioned in accordance with current instructions; 1939 Handbook of the Hospital Corps; Blakiston's Illustrated Pocket Medical Dictionary; Pharmacopoeia of the United States of America; The National Formulary; The Merck Manual of Therapeutics and Materia Medica.

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BUMED INSTRUCTION 6020.1 23 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: All Naval Hospitals, Hospital Ships, and Stations having Infirmaries

Subj: Patients' personal effects

1. This instruction prescribes the procedure for the handling of the personal effects of patients at in-patient treatment facilities. BuMed C/L 50-61 is cancelled.

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BUMED NOTICE 6020 23 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Forms NAVMED-G (Hospital Ticket) and NAVMED-416 (Hospital Ticket-women); cancellation of

Ref: (a) BuPers C/L 49-52; NDB 31 March 1952, 52-144

1. Ref. (a) provides for the use of standard transfer orders for transferring enlisted personnel to and from naval medical treatment facilities. Former NavMed G and NavMed-416 are no longer required. Article 23-217 MMD is cancelled.

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BUMED INSTRUCTION 4600.1 23 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Preembarkation Certificate, DD Form 625, and physical examination for overseas travel of dependents in MSTS vessels and MATS planes

Ref: (a) NavPers-15842, Overseas Transportation Information for Navy Dependents, Aug 1951

1. This instruction contains regulations for the preparation and submission of Preembarkation Certificates, DD Form 625, and outlines requirements for physical examination at ports of embarkation for the travel of dependents of military and civilian personnel of the Naval Establishment. BuMed C/L 51-80 and 52-14 are cancelled.

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BUMED NOTICE 6200 29 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations with Medical Department Representatives

Subj: Preventive Medicine Reports

Ref: (a) NavMed P-5001, Dec 1951

1. This notice informs activities and personnel concerned of changes in regard to the submission of preventive medicine reports.

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BUMED INSTRUCTION 6150.2 30 Oct 1952

From: Chief, Bureau of Medicine and Surgery
To: All Continental Shore Stations Having Medical Corps Personnel Attached

Subj: Medical and Health Records; forwarding of upon release or discharge of personnel

1. This instruction sets forth a procedure for expeditious transmittal to the Bureau of Medicine and Surgery of Medical and Health Records which may be required by the Veterans Administration in the adjudication of claims filed by individuals following release or discharge from service. BuMed C/L 52-26 is cancelled.

PREVENTIVE MEDICINE SECTION

Navy Preventive Medicine Conference a Success

The first conference of officers of the Navy Medical Department engaged in preventive medicine concluded its program at Cleveland, Ohio, on 23 October 1952. Five days were spent in formal and informal discussion of Navy problems, and 2 additional days were allowed for attendance at the scientific meetings and exhibits of the American Public Health Association.

Representatives from each naval district, from fleet, air, and Marine commands, and from shore-based preventive medicine units were in attendance. Guest speakers included national leaders in the fields of epidemiology, preventive medicine, laboratory, food, and environmental sanitation. Industrial hygiene, as a phase of preventive medicine, was included, and three industrial hygienists were present.

The best utilization of properly trained personnel was a major point of discussion at committee meetings. Cooperation between the Bureau of Medicine and Surgery and the Bureaus of Supplies and Accounts, Ships, and Yards and Docks in many areas of joint interest in safe food practices and healthful environment was widely discussed by delegates from the respective Bureaus. The conferees acclaimed the proposed plan for merging the annual Preventive Medicine Report with a suitable report of an annual medical inspection of ships and stations, and the elimination of the composite reports from district and fleet commands. A BuMed instruction eliminating the annual report for the current calendar year is being promulgated.

Venereal Disease Control

"Critical" Versus "Incubation" Period in VD Contact Reporting

Interviewers seeking to identify and locate contacts of venereal disease patients have long made use of tables of incubation periods of the various diseases in order to determine the period of time in which the contacts may have been made. This practice has been based on the established fact that subsequent to an exposure, certain signs and symptoms will develop in a certain number of days.

Since strict adherence to the accepted incubation period often proves unproductive (i. e., the contacts named are noninfected), other factors must be taken into consideration. One is the duration of the infection after

the symptoms appear. The interviewer must depend upon the patient's knowledge and honesty in securing accurate information as to this period. Because the service man is carefully taught how to recognize the signs and is also aware of the strict regulations and punitive measures if he conceals the presence of the disease, he is rarely willing to admit that he had had the symptoms more than 1 or 2 days. When he gives inaccurate information on this, the interviewer is unable to establish the probable date of the contact or the persons involved.

Even when the patient makes an honest statement another factor may lead the interviewer to an erroneous conclusion; this factor is the possibility of variation in the accepted period of incubation. Variations may be due to the causative organism itself, the response of the individual host to the infection, or the action of a prophylaxis used at or near the time of infection, or for other reasons.

To remedy the difficulties of determining the period in which the contacts may have been made, a new gauge has been set up——the "critical" period——this to include the total length of time the symptoms have been evident, plus the maximum possible earlier period in which the disease could have been incubating within the body of the patient. Interviewers are urged to take this "critical" period into consideration rather than base all their assumptions on the incubation period alone. (Recommendation of Robert R. Lugar, Public Health Service Representative in charge of training program for venereal disease interviewers.)

A survey of results of follow-up on contact reports shows that in many localities a profitable number of new infections is discovered even when contact reports are submitted on exposures occurring prior to the beginning of the critical period. Therefore interviewers are advised to make a liberal interpretation of the length of the critical period.

Insect and Rodent Control

Control of Leptospirosis in the Kodiak and Aleutian Islands

Leptospirosis is a general term covering infectious spirochetal jaundice caused by any one of twenty strains of Leptospira organisms. It is characterized by a sudden rise in temperature, muscular pains, sharp headache, general malaise, and frequently jaundice. It is easily mistaken for appendicitis or influenza. The most common type encountered in North America is that caused by Leptospira icterohaemorrhagiae and designated as Weil's disease.

The infective organism eventually lodges in the victim's kidneys and is excreted in the urine, through which the disease may be spread to others. Epidemics occur when the rat population becomes infected and improper sanitation permits contact of rat's urine with food or drinking-water supplies. The disease can be picked up in other less common ways.

A survey by the U. S. Public Health Service at the Arctic Health Research Center in Anchorage, Alaska, in 1951 revealed a considerable incidence of leptospirosis in Alaska. In May 1951 at the request of the Commandant, 17th Naval District, a Navy control team was ordered to Kodiak Island to organize a control program. The program developed by this team consisted of 8 successive steps: (1) Discussion of the epidemic with Territory and U. S. Public Health Service officials to determine the background and incidence of the disease and to obtain services for laboratory diagnosis. (2) Epidemiologic surveys of the town, revealing a high Norway rat population because of indiscriminate methods of garbage disposal, soil and weather conditions, and type of construction in use. (3) Interviews of disease victims to determine the source of infection in individual cases. These were principally from contaminated food, most of which came in via the city dock for civilians; also from private well water, soiled clothing, and an infected dog. (4) A many-sided educational program aimed at the civilian population. As far as the naval population was concerned, it was relatively easy to prevent transmission through infective food by medical inspection of food establishments and use of "off-limits" restrictions. (5) City-wide cleanup——the Navy and the City Council cooperating. (6) A campaign to poison rats with warfarin, after their food supply and harborage were removed. (7) Elimination of stray dogs. (8) Survey of the city water system and dissemination of information on chlorine treatment of the water.

Large rodent populations were also found around naval stations in the Aleutian Islands, but it was not deemed practical or necessary to control the rats in the uninhabited areas. By maintaining good control measures on the perimeter of the populated areas, the migrating rats can be prevented from being established inside the areas. Ratproofing of buildings wherever possible, elimination of harborages, use of permanent warfarin poison-bait stations, proper food storage, and good sanitation practices were outlined for the guidance of naval activities in the Aleutian chain. Recommendations were made for stricter rodent-control measures on Alaskan shipping to check the present menace of leptospirosis and the potential menace of plague and typhus in the area.

(The foregoing information was abstracted from a report by a U. S. Navy Epidemic Disease Control team consisting of LTJG E. L. Walter (MSC) USNR and W. G. Cunningham, HMC, USN)

Leptospirosis has recently been shown to be the cause of outbreaks of fever of unknown origin in many areas of the United States, with protean and confusing manifestations——not only the usual liver and kidney involvement, but also muscle pain and spasm, and even pleocytosis. It has been mistakenly diagnosed as poliomyelitis and coxsackie virus disease.

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Procedure for Scheduling of Mosquito Fogging

Malaria and Mosquito Control Unit #1, at NAS Jacksonville, Fla., has explained in a memorandum the procedure it uses for scheduling mosquito-fogging operations. It is based on a survey of the need, since regulations require that such a survey be made and that only when results show that the prevalence of mosquitoes justifies the expenditure should the fogging operations be employed.

Traps are set out at 5 strategic locations on the station, and the various species collected are identified each day. Florida has over 70 species of mosquitoes, but less than 25 are serious biters of man. It has been decided that when more than 15 of the biting-type species are caught in a single trap in one evening, the fog jeep should be used; when there are large numbers in most of the traps, the spray plane swings into action.

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Poisoning From Chlordane Fumes

A case, believed to be the first on record, of poisoning from fumes of the insecticide chlordane, was treated at San Diego Naval Hospital. It involved a 33-year-old housewife who slept in a closed apartment without airing it after it had been sprayed during the day. Her symptoms were vomiting and severe coughing when she awoke about 3 a.m. Lung involvement and disturbance of liver function were indicated by tests. Her susceptibility to liver damage from the fumes was believed by physicians to be increased by obesity and "definite alcoholic tendencies." The patient recovered. (J. A. M. A., Aug. 2, 1952, G. B. Lemmon, Jr. and CDR W. F. Pierce (MC) USN)

Training and Visual Aids

New Navy Publications on Artificial Respiration

NavMed P-5002 (a 15-by 27-inch poster) and NavMed P-5003 (a more detailed, 8-page brochure) on the back-pressure, arm-lift method of artificial respiration have just been published. The brochure is intended as an instructional tool in the teaching of this newly approved method—known as the Holger-Nielson Method—of artificial respiration. These publications have been stocked at distribution centers in Scotia, N. Y., and Spokane, Wash., and requests should be made to those centers through district printing and publications offices. The expectation is that there should be not more than one brochure to 10 people.

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The Use of Films in Training

"Instructional Film Research (Rapid Mass Learning) 1918-1950" presents findings of 30-year investigations of the field of training through motion pictures. The publication (Technical Report No. SDC 269-7-19) was issued by the Special Devices Center. It may be requested through channels from the Commanding Officer and Director, Special Devices Center, Sands Point, Port Washington, Long Island, N. Y. (Code 1543).

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Training Package for Sex-Hygiene Instructors

Through the cooperation of BuMed and BuPers, a training package consisting of full-color VD transparencies, NavPers 110052-1 through 10, and a publication entitled Instructor's Guide for the Presentation of Sex Hygiene and Venereal Disease Facts Using Ozalid Transparencies, BuMed P-5007, has been developed. The Instructor's Guide was designed to assist instructors in planning and presenting lessons covering the topics of sex education, sex hygiene, and venereal disease facts, and the individual's responsibility and preventive measures.

Emphasis is placed on a recommended sequence of presentation which not only indicates a most effective way to use the ozalid transparencies, but also points out the need for laying the foundation of a healthy attitude toward sex before proceeding to the medical presentation of sex hygiene and venereal disease facts. The Guide also includes pertinent suggestions for instructors, well-developed lesson plans, and the 50 questions most commonly asked by naval personnel and appropriate answers to these questions. These materials are now available at Naval District Training Aids Sections. (Naval Training Bulletin, Sept. 1952)

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Instruction Aboard Ship

A voyage medical report indicates that a 6-hour course, 1-1/2 hours nightly for 4 nights, was given to 92 members of the steward's department. The methods outlined in the "Instructor's Guide, Sanitary Food Service," NavMed P-1333, were followed. Certificates of completion of the course were issued to all attending the 4 sessions. Interest was high and the results considered satisfactory.

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General Sanitation

Food Poisoning and Infection on MSTS Ships

In the first 8-1/2 months of 1952 approximately 2,620 persons were involved in 7 food-poisoning epidemics in MSTS ships of one area. The epidemics ranged from mild to severe. In one instance 655 persons were affected; one of them was in a comatose condition when admitted to the sick bay and would have died if the medical officer had not applied artificial respiration and restoratives immediately.

What were the causes of these outbreaks? They were the usual ones found in all vessels of the Navy in which food poisoning and food infections have occurred. Outbreaks were usually caused by staphylococcus contamination, and arose in connection with certain types of foods, the ways in which they were prepared and kept, the personal habits and conditions of the food handlers, and the facilities for and methods of sanitizing mess gear. The principal offenders were turkey (improperly thawed under water and thus exposed to contamination and bacteria-propagating temperatures for a prolonged period); corned-beef hash (left at room temperature overnight and reheated but not cooked the next morning); ham (left at galley temperature for several hours); and mushroom sauce prepared from soup stock (probably improperly refrigerated). Food-service workers were found to be inadequately indoctrinated in proper methods of handling food and sanitizing dishes, some had poor habits of personal hygiene, some were not closely screened for freedom from communicable diseases and infectious conditions. Sanitation of dishes was sometimes inadequate, because of improper prewashing facilities, wash and rinse temperatures that were too low, and overloaded dishwashing equipment. In one case the temperature of the refrigerator was not maintained at a low enough level.

To prevent further occurrences of food poisoning and infection, a 40-page set of instructions has been distributed by Commander, Military Sea Transport Services, which will lessen the opportunity for contaminating food and reduce to a minimum conditions which promote the growth of pathogenic bacteria. These instructions delineate the responsibilities of the medical and steward departments and deal with the fields of food-handler training; adequate and frequent physical examinations of food-service personnel; maintenance of equipment for refrigerating food, sanitizing mess gear, and washing up for the food-service personnel and steward department; proper handling of specific foods; and frequent inspections of food-preparation areas and practices by the medical officer.

Environmental Sanitation Technicians are being assigned to MSTS area and subarea commands to conduct under-way surveys and training of food-service personnel and to assist in discovering and eliminating all possible hazards of food-borne disease.

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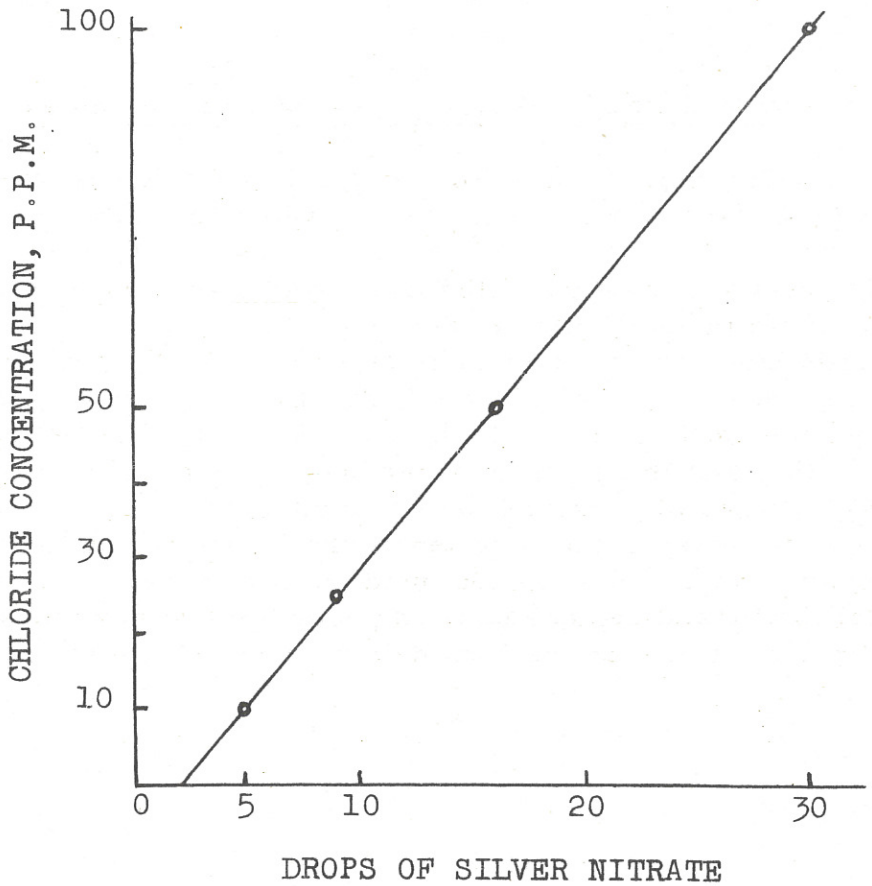
Test for Sea Water in Drinking Water

A semiquantitative method for determining possible cross connection between sea-water and drinking-water lines, described by Alfredo Salazar of the Boston Naval Shipyard, follows:

Reagents:

1. 1% potassium chromate solution: Weigh 1 gram and dissolve in 100 cc. distilled water (store in clear glass bottle).



2. N/100 silver nitrate solution: Weigh 0.85 gram of the solid silver nitrate and dissolve in 500 cc. distilled water (store in brown bottle).

Equipment:

8-oz. glass collecting bottles.

2 eye droppers, one for the chromate solution, the other for the nitrate solution.

1 set of test tubes marked to 5 and 10 cc. and rack.

1 calibration chart (see #4 of "Procedure").

Procedure:

1. Measure 5 cc. of water sample in a test tube.
2. Add 10 drops of 1% potassium chromate solution.
3. Add silver nitrate solution dropwise, one drop at a time, to the tube containing the water sample and chromate; shake after each drop has

been added and compare color against that of the chromate bottle. Count the drops and continue additions until a slight reddish coloration appears.

4. Compute the concentration of chloride in the water by means of a calibration chart prepared from known concentrations of chloride in water. The calibration chart shown here should suffice for semiquantitative estimation.

5. If more than 25 p. p. m. chloride are found, the possibility of cross connection with sea water should be investigated.

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Procedures for the Collection of Water Samples

The following excerpts are from a COMFOURTEEN instruction which sets forth procedures for the collection of water samples for bacteriologic examinations:

1. Samples are to be collected from widely separated points in the water system (to include points of heavy and light use).

2. Collections are to be made in standard 4-ounce prescription bottles, prepared by placing 1 cc. of a 1-1/2%, freshly prepared sodium thiosulfate solution in each bottle before autoclaving. Screw the cap on the bottle and cover top with a 4-inch square of paper secured with string. Autoclave bottles at 20 pounds of pressure for 20 minutes.

3. Open water spigot or scuttlebutt and let water run for 5 minutes before opening bottle; keep cap and inside of paper sterile.

4. Fill bottle and replace cap and paper to prevent contamination.

5. Place the bottle on ice until delivered to the laboratory.

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